

What is claimed is:

1. A control method for an automatic transmission comprising:
applying a hydraulic pressure of a working fluid to a plurality of frictional elements of the automatic transmission to control shifting of gears of the automatic transmission;

varying a command value given to means for adjusting pressure of the working fluid; and

determining whether gear shifting is permissive or not based on time variation of the hydraulic pressure applied to the frictional element that is adjusted by the pressure adjusting means according to the command value and detected by a means for detection of hydraulic pressure.

2. The control method for an automatic transmission according to claim 1, wherein when the hydraulic pressure applied to the frictional element to be engaged in a target gear of the gears is defined as an engaging-side applied hydraulic pressure, and the command value for causing the pressure adjusting means to adjust the hydraulic pressure applied to the frictional element to be released in the target gear to a maximum pressure is defined as a complete engagement command value,

the method further comprises:

determining that gear shifting is prohibited if the engaging-side applied hydraulic pressure detected by the detecting means does not vary when the command value is varied; and

providing the complete engagement command value to the pressure adjusting means.

3. The control method for an automatic transmission according to claim 1, wherein when the command value for adjusting the applied hydraulic pressure to achieve gear shifting in the target gear is defined as a permissive command value,

the method further comprising:

determining that the gear shifting is to be permitted if the applied hydraulic pressure detected by the detecting means varies when the command value is varied; and

providing the permissive command value to the pressure adjusting means.

4. The control method for an automatic transmission according to claim 3, further comprising:

estimating a time variation of the applied hydraulic pressure based on the command value that has been varied; and

wherein if the estimated variation matches actual time variation,

giving the permissive command value to the pressure adjusting means at a normal timing.

5. The control method for an automatic transmission according to claim 4, further comprising:

correcting the normal timing if the estimated variation does not match the actual time variation; and

providing the permissive command value to the pressure adjusting means at the corrected timing.

6. The control method for an automatic transmission according to claim 5, wherein when the hydraulic pressure applied to the frictional element to be engaged in a target gear of the gears is defined as an engaging-side applied hydraulic pressure, and the permissive command value for causing the pressure adjusting means to adjust the hydraulic pressure applied to the releasing-side frictional element to be released in the target gear of the gears to a minimum pressure is defined as a complete release command value,

the method further comprises:

giving the complete release command value to the pressure adjusting means at the corrected timing if the time variation of the engaging-side applied hydraulic pressure does not match the estimated variation, the time variation being detected by the detecting means when the command value is varied.

7. The control method for an automatic transmission according to claim 4, wherein when the hydraulic pressure applied to the frictional element to be engaged in a target gear of the gears is defined as an engaging-side applied hydraulic pressure,

the method further comprises:

varying the command value after a passage for transmitting the engaging-side applied hydraulic pressure has been filled with working fluid; and

determining the estimated variation to be compared with the time variation of the engaging-side applied hydraulic pressure.

8. The control method for an automatic transmission according to claim 1, further comprising:

determining whether gear shifting is permissive or not according to a plurality of time variations obtained in a time series.

9. A control device for an automatic transmission for applying a hydraulic pressure of a working fluid to a plurality of frictional elements of the automatic transmission to control shifting of gears of the automatic transmission, the device comprising:

means for adjusting a hydraulic pressure applied to at least one of the frictional elements according to a command value;

means for detecting the applied hydraulic pressure; and

means for varying the command value given to the pressure adjusting means and for determining whether gear shifting is permissive or not based on time variation of the applied hydraulic pressure detected by the detecting means.

10. The control device for an automatic transmission according to claim 9, wherein when the hydraulic pressure applied to the frictional element to be engaged in a target gear of the gears is defined as an engaging-side applied hydraulic pressure, and the command value for causing the pressure adjusting means to adjust the hydraulic pressure applied to the frictional element to be released in the target gear to a maximum pressure is defined as a complete engagement command value,

the varying and determining means decides that gear shifting is to be prohibited if the engaging-side applied hydraulic pressure

detected by the detecting means does not vary when the command value is varied; and

providing the complete engagement command value to the pressure adjusting means.

11. The control device for an automatic transmission according to claim 9, wherein when the command value for adjusting the applied hydraulic pressure to achieve gear shifting in the target gear is defined as a permissive command value,

the varying and determining means determines that the gear shifting is to be permitted if the applied hydraulic pressure detected by the detecting means varies when the command value is varied, and provides the permissive command value to the pressure adjusting means.

12. The control device for an automatic transmission according to claim 11, wherein the varying and determining means estimates the time variation of the applied hydraulic pressure based on the command value that has been varied, and if the estimated variation matches actual time variation, gives the permissive command value to the pressure adjusting means at a normal timing.

13. The control device for an automatic transmission according to claim 12, wherein the varying and determining means corrects the normal timing if the estimated variation does not match actual time variation, and gives the permissive command value to the pressure adjusting means at the corrected timing.

14. The control device for an automatic transmission according to claim 13, wherein when the hydraulic pressure applied to the frictional element to be engaged in a target gear of the gears is defined as an engaging-side applied hydraulic pressure, and the permissive command value for causing the pressure adjusting means to adjust the hydraulic pressure applied to the releasing-side frictional element to be released in the target gear of the gears to a minimum pressure is defined as a complete release command value,

the varying and determining means gives the complete release command value to the pressure adjusting means at the corrected timing if the time variation of the engaging-side applied hydraulic pressure does not match the estimated variation, the time variation being detected by the detecting means when the command value is varied.

15. The control device for an automatic transmission according to claim 12, wherein when the hydraulic pressure applied to the frictional element to be engaged in a target gear of the gears is defined as an engaging-side applied hydraulic pressure,

the varying and determining means varies the command value after a passage for transmitting the engaging-side applied hydraulic pressure has been filled with working fluid, and determines the estimated variation to be compared with a time variation of the engaging-side applied hydraulic pressure.

16. The control device for an automatic transmission according to claim 9, wherein the varying and determining means

judges whether the gear shifting is permissive or not on the basis of a plurality of time variations obtained in a time series.